Federal Lands Roads Working Group

CalTrans (California DOT)
Merging Federal Land Data

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Innovation and System Information

Project Scope

Incorporate 2018 GIS data from 5 Federal agencies into CalTrans 2019 Local LRS

- Bureau of Land Management
- Bureau of Reclamation
- National Park Service
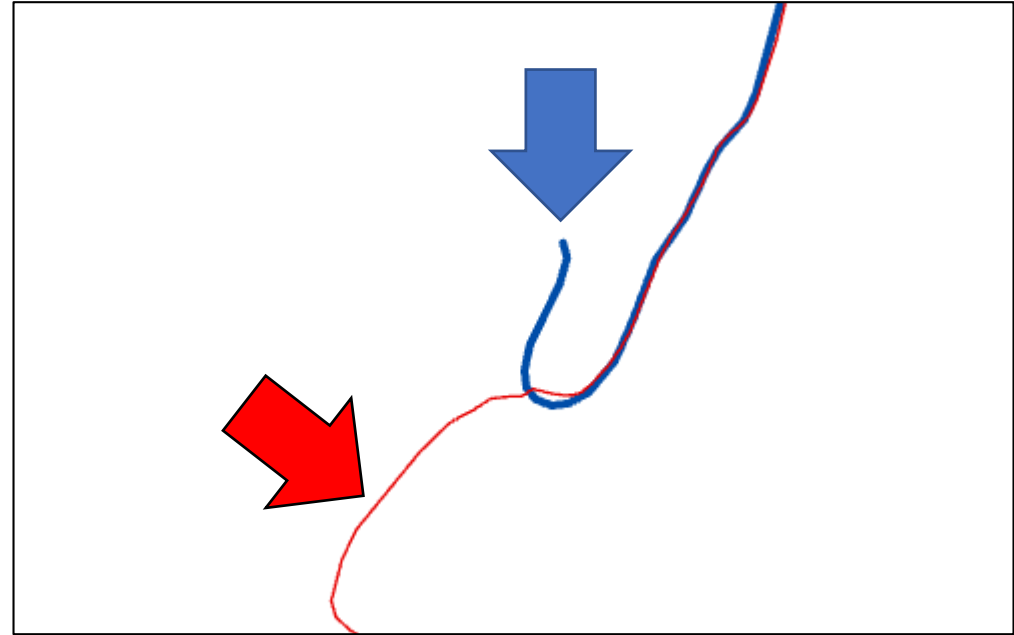- US Fish and Wildlife Service
- US Forest Service

Incorporate mileages of Federally owned roads in California to the Local LRS for annual reporting to FHWA

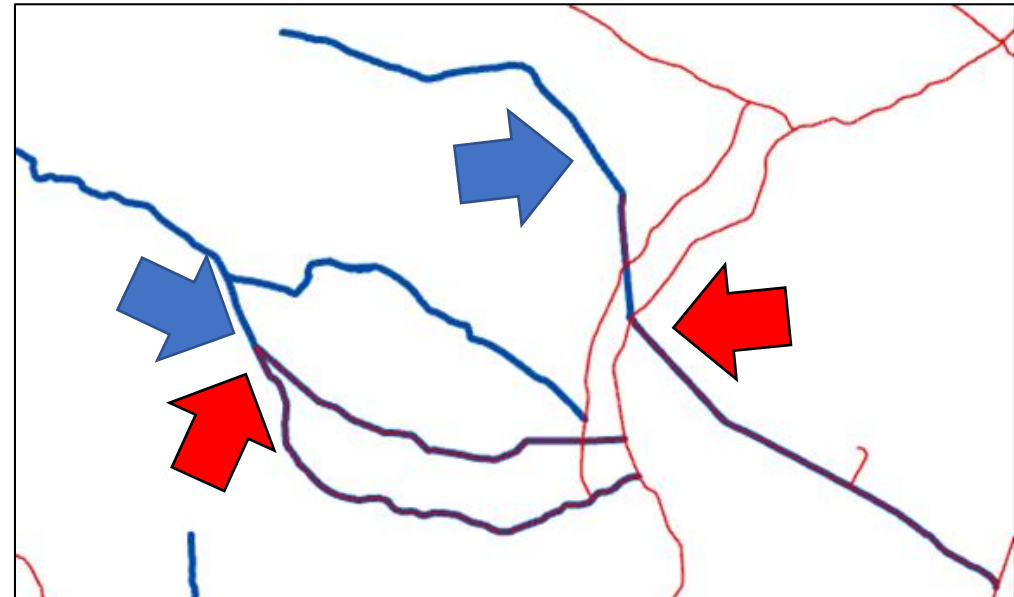- Software used: ArcGIS Pro 2.6

Challenges #1

The Local LRS extends past the end points of Federally owned roads
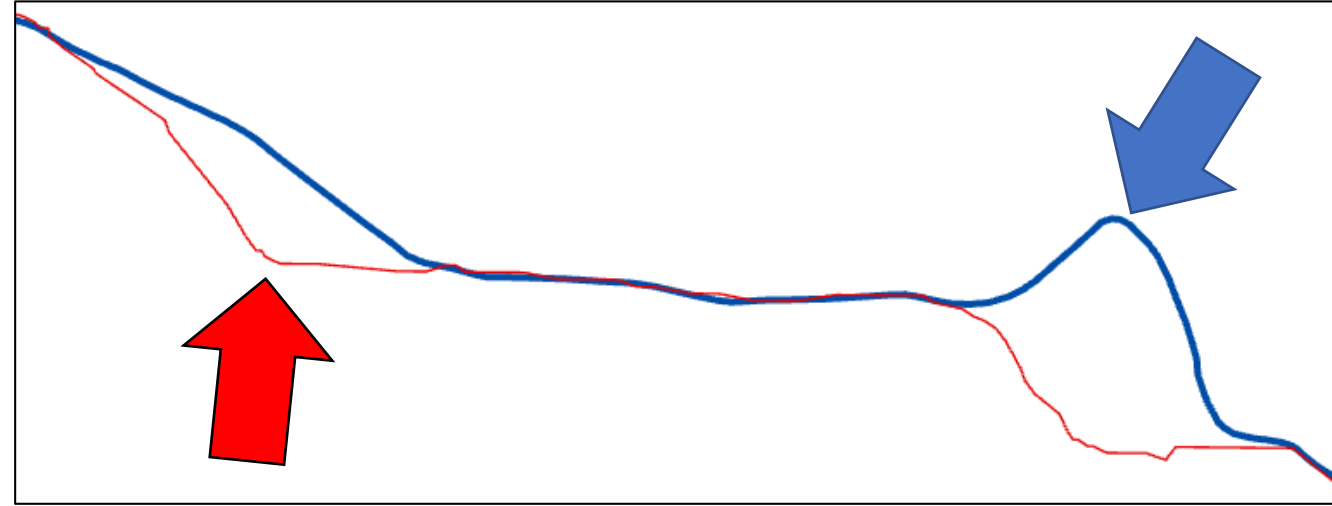
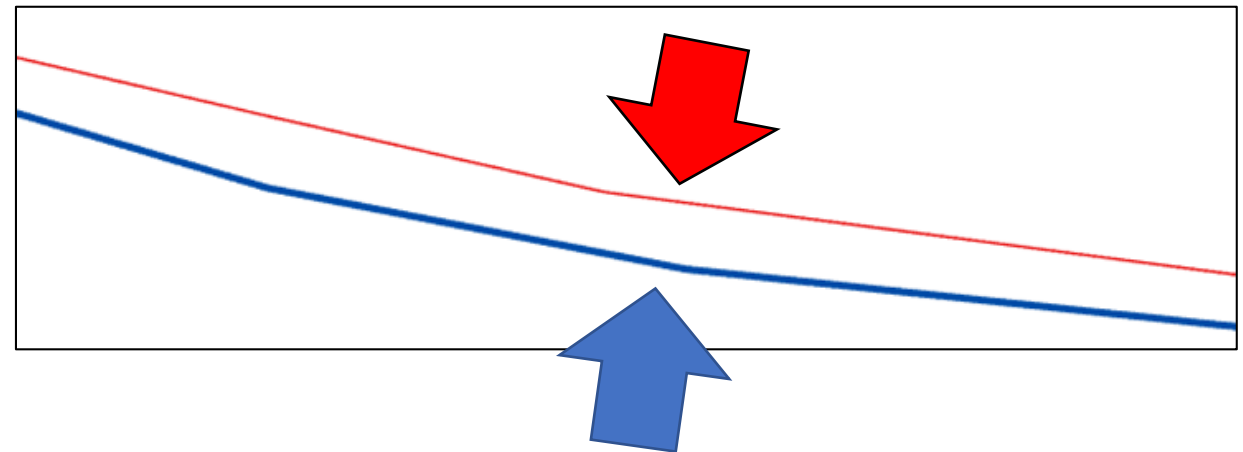Federally owned roads extend past the end points of the Local LRS

Challenges #2

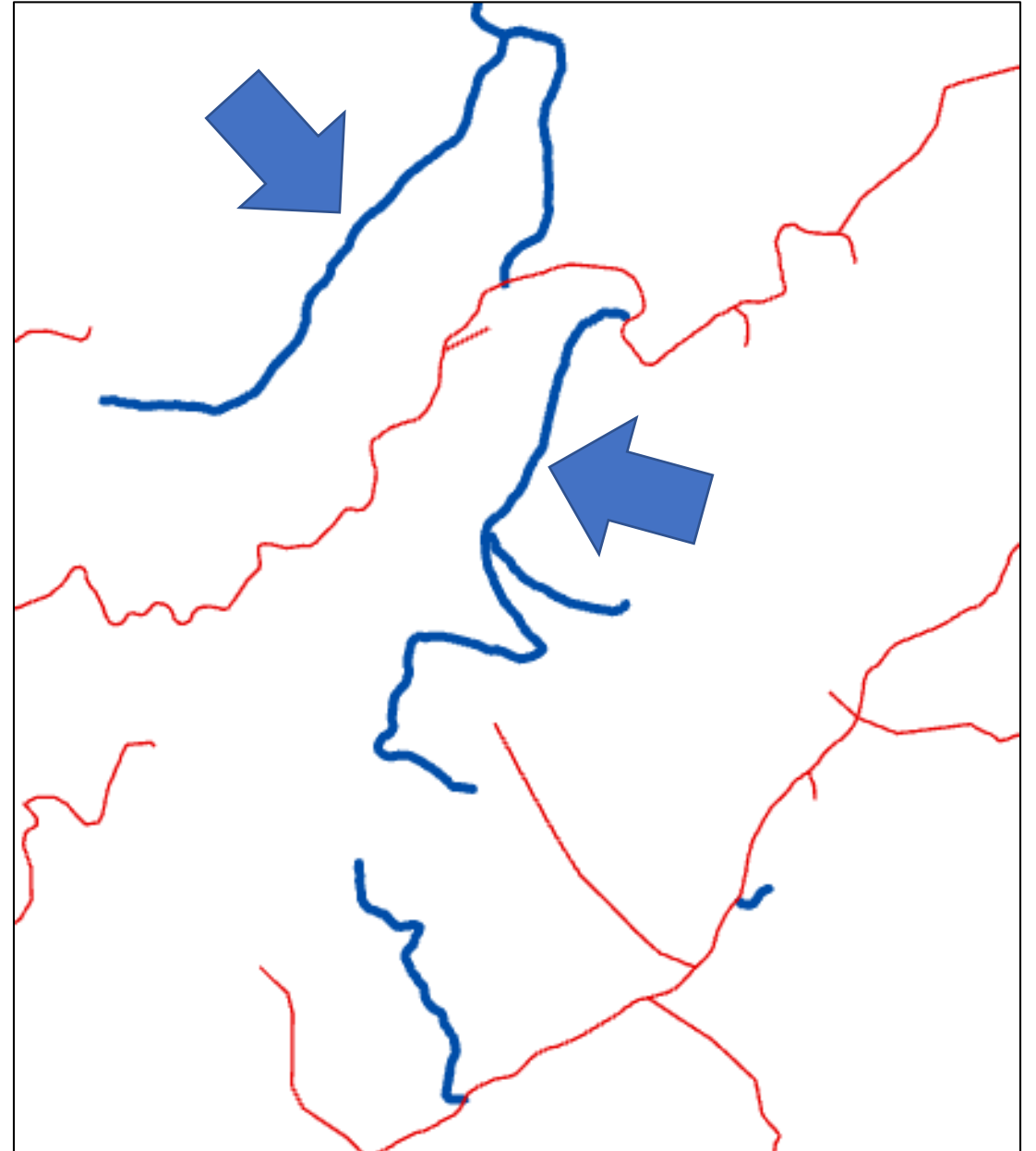Incongruent geometries between matching Federally owned roads and the Local LRS

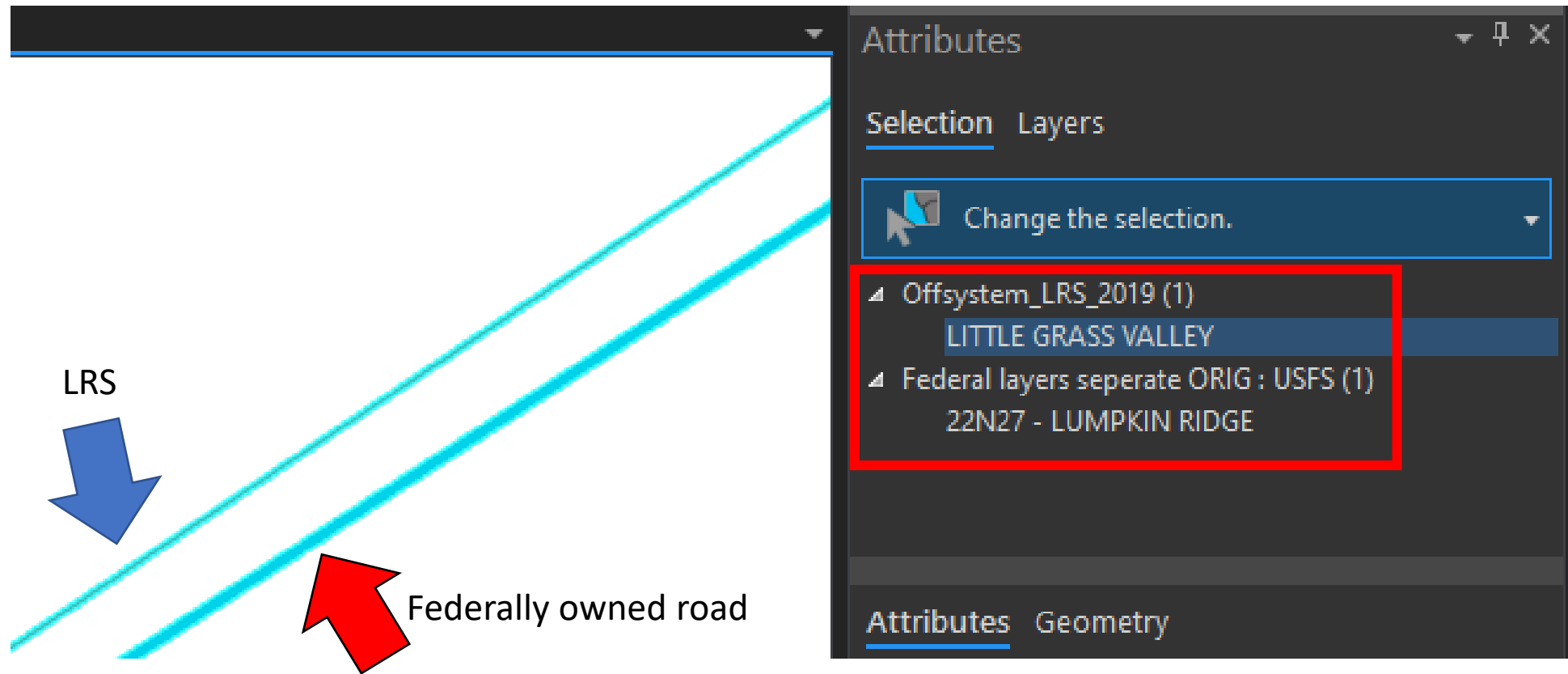Gaps between matching Federally owned roads and the Local LRS

Challenge #3

Extra Federal agency roads that are completely missing from the Local LRS

Challenge #4

Visually matching Federally owned roads and Local LRS have different names

Isolate Relevant Roads from Local LRS

The complete LRS dataset is too large for the scope of this project

- Isolate only relevant roads from LRS:
  - The roads that are supposed to match with the Federally owned roads

Select By Location to identify LRS roads that Intersect Federally owned roads

- Save selection as separate layer **"Fed_Intersect_LRS"**
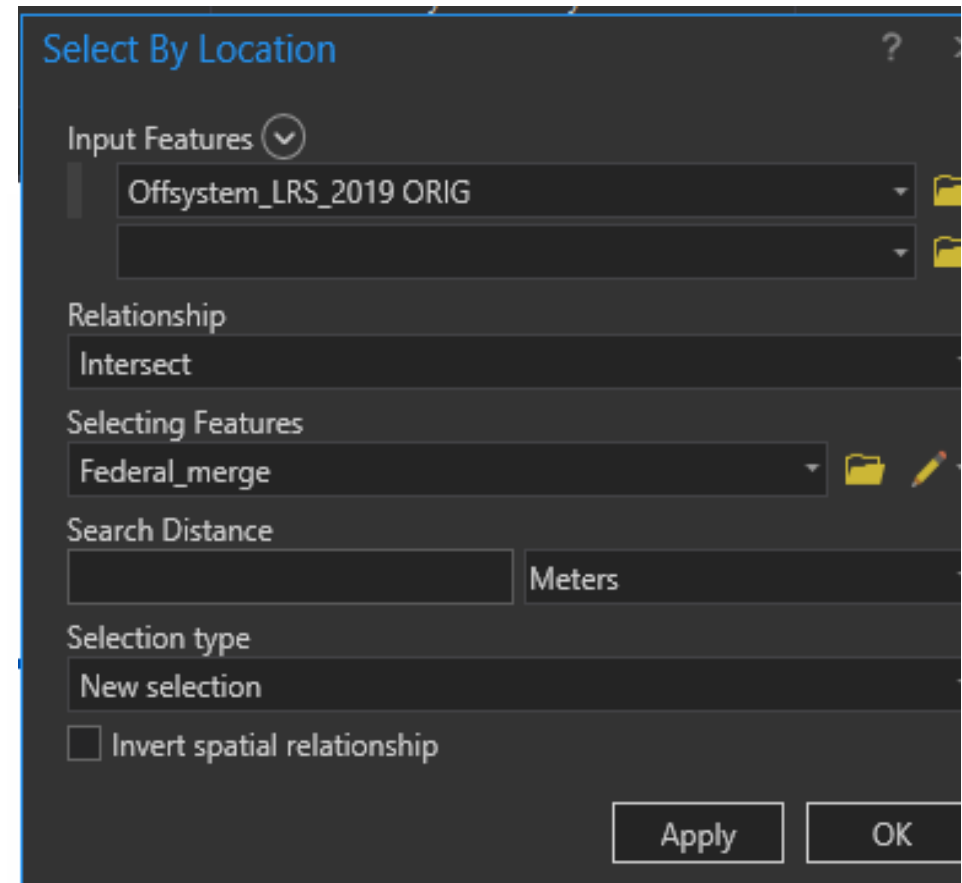
Isolate Federally Owned Roads Missing from LRS

As identified in Challenge #3

- Later, Merge these roads into the LRS

Select By Location to identify Federally owned roads that Do NOT Intersect the LRS

- Save selection as separate layer = **"Fed_MissingFrom_LRS"**
- Selection does NOT identify all the missing roads; still need to identify missing roads that DO Intersect the LRS
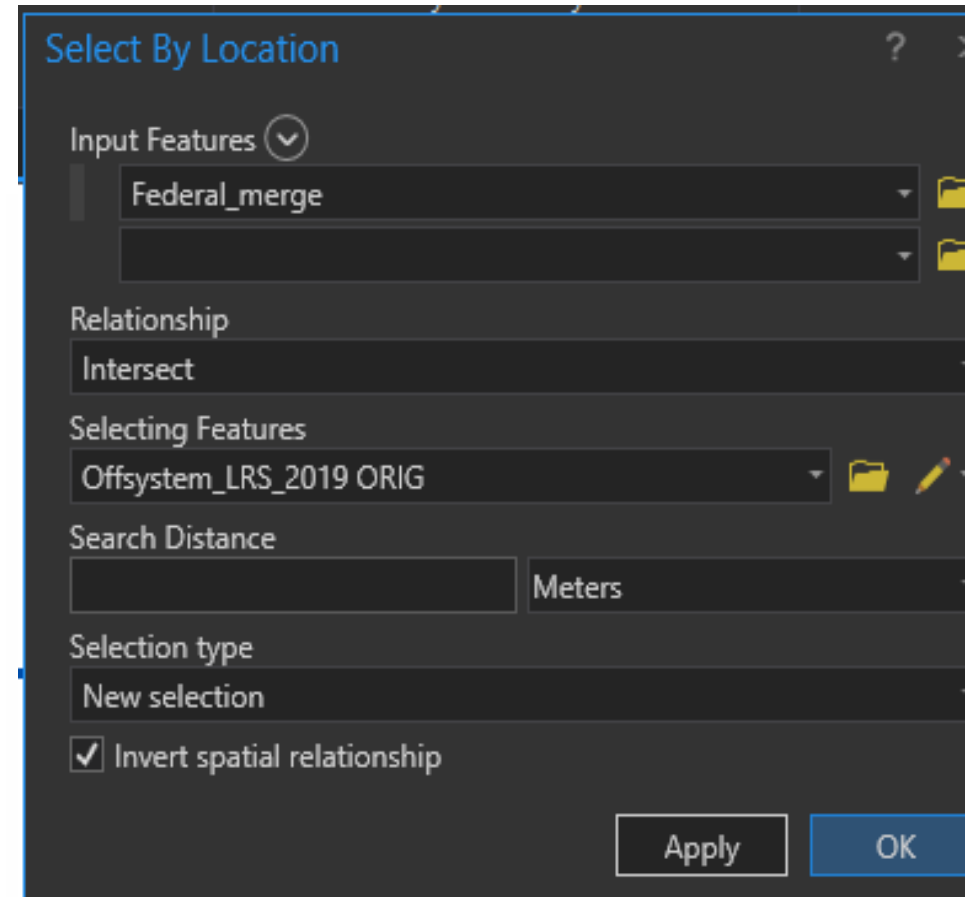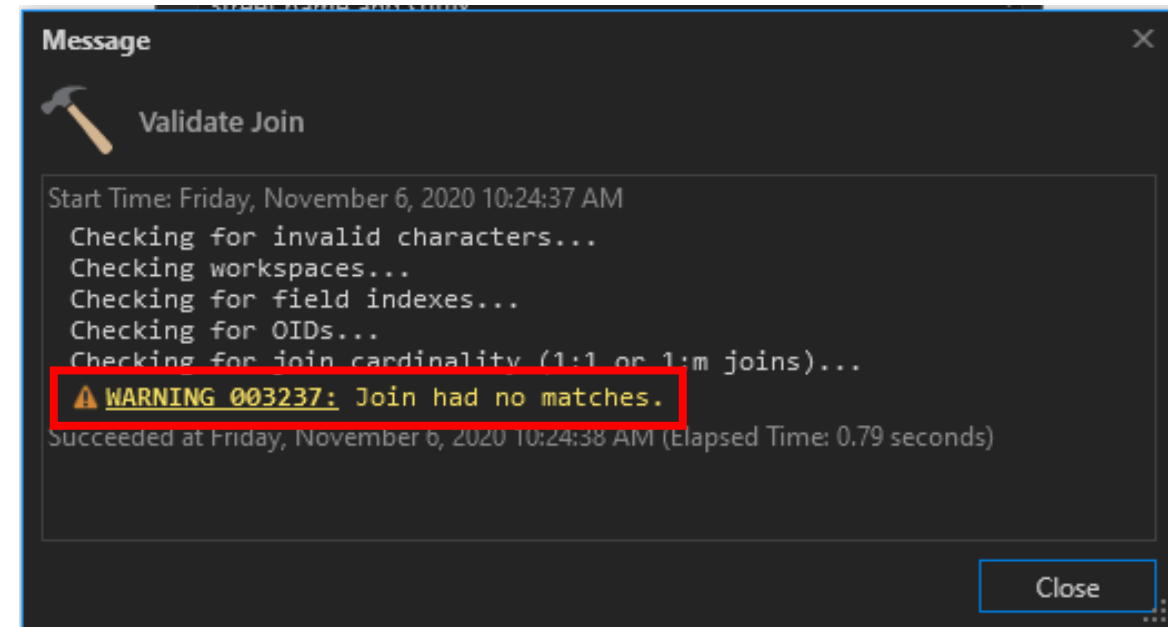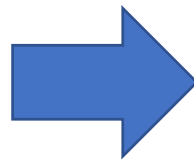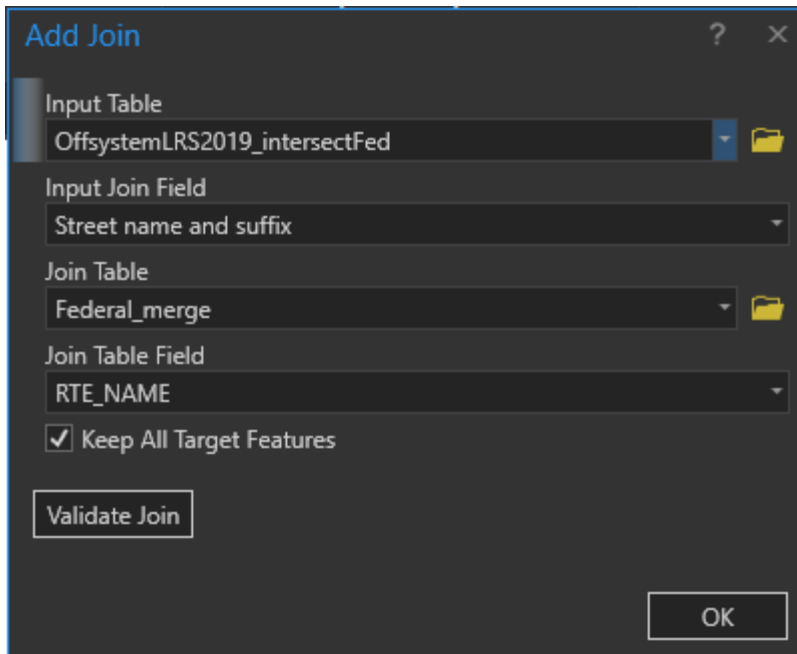
Table Join

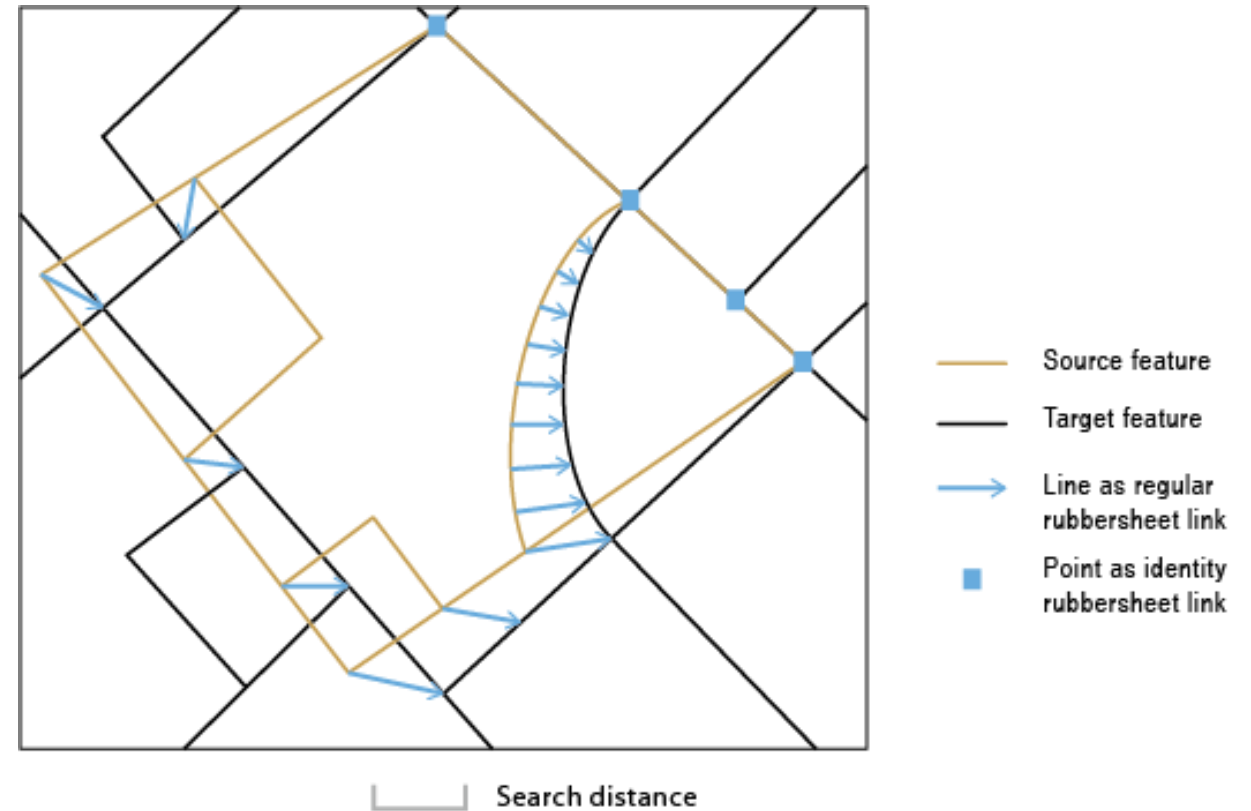Attempting to incorporate Federally owned roads to Local LRS via Table Join **failed**

- Attempted Join Field was "route name"/"street name"
- Table Join returned 0 matches
- Too many differences in names, even between roads that are a visual match

Generate Rubbersheet Links

Use the Generate Rubbersheet Links Tool to generate lines (arrows) that indicate where **"Fed_Intersect_LRS"** needs to be edited to match the Federally owned roads
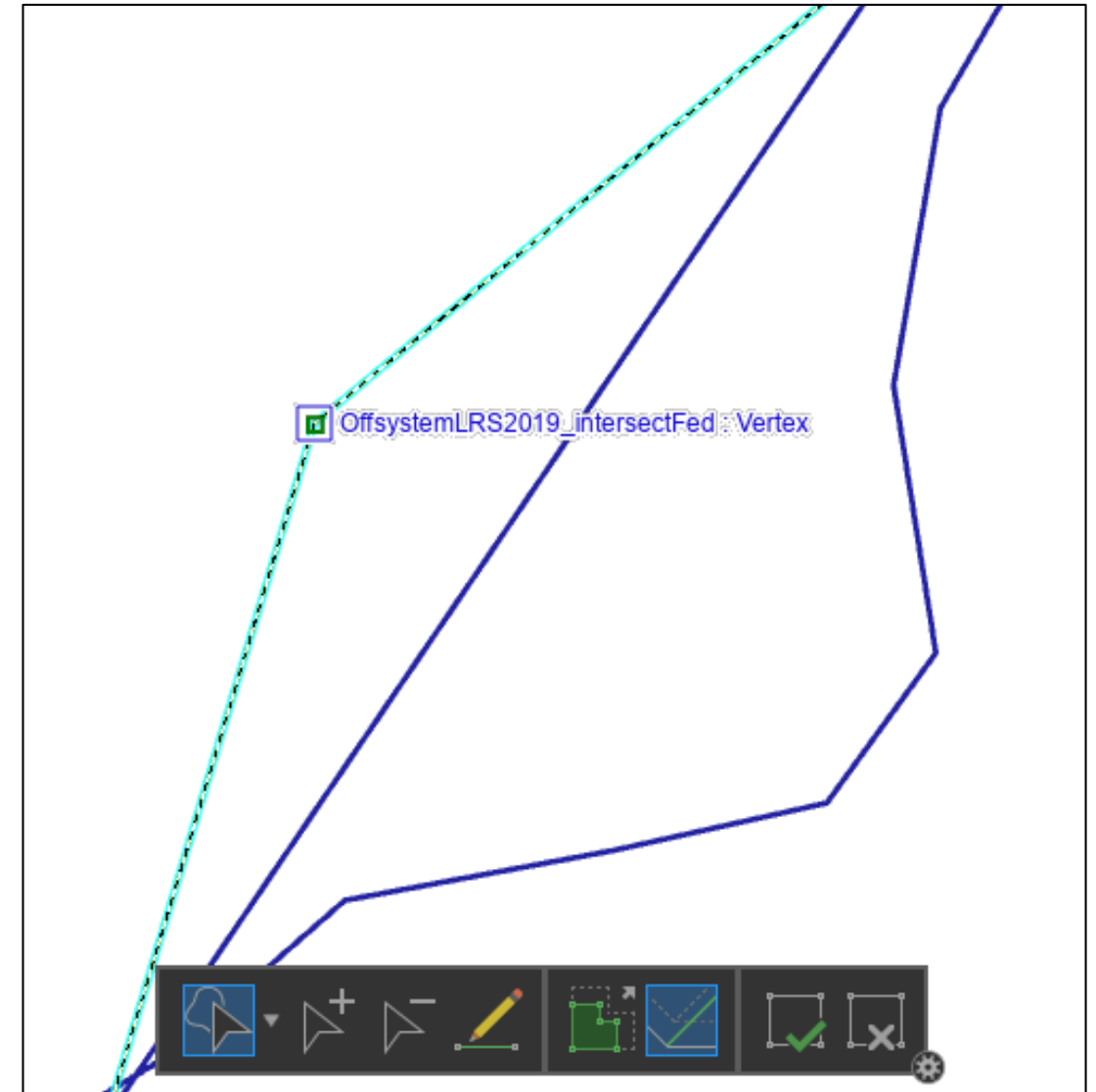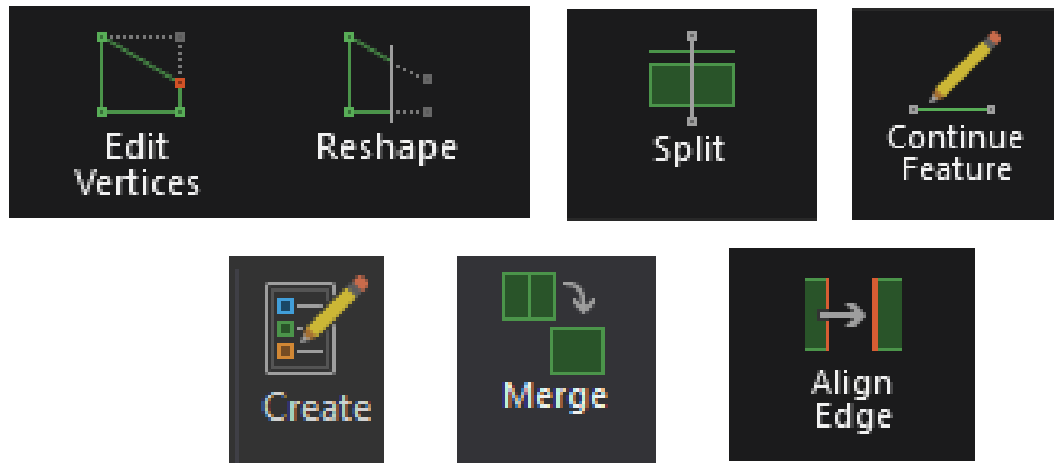
Use these arrows to determine where to make edits to the LRS

Source feature
Target feature
Line as regular rubbersheet link
Point as identity rubbersheet link
Search distance

Source: Esri

Manual Editing 1 (geometry)

Assortment of Editing tools used to adjust **"Fed_Intersect_LRS"** geometry to make it match geometry of Federally owned roads

Manual Editing 2 (attributes)

Incorporate route name and Federal ownership attribute data from Federal layers to matching Local LRS roads

Matching Federal and LRS roads…

Incorporate Federal agency road name and ownership attributes into LRS road attribute table
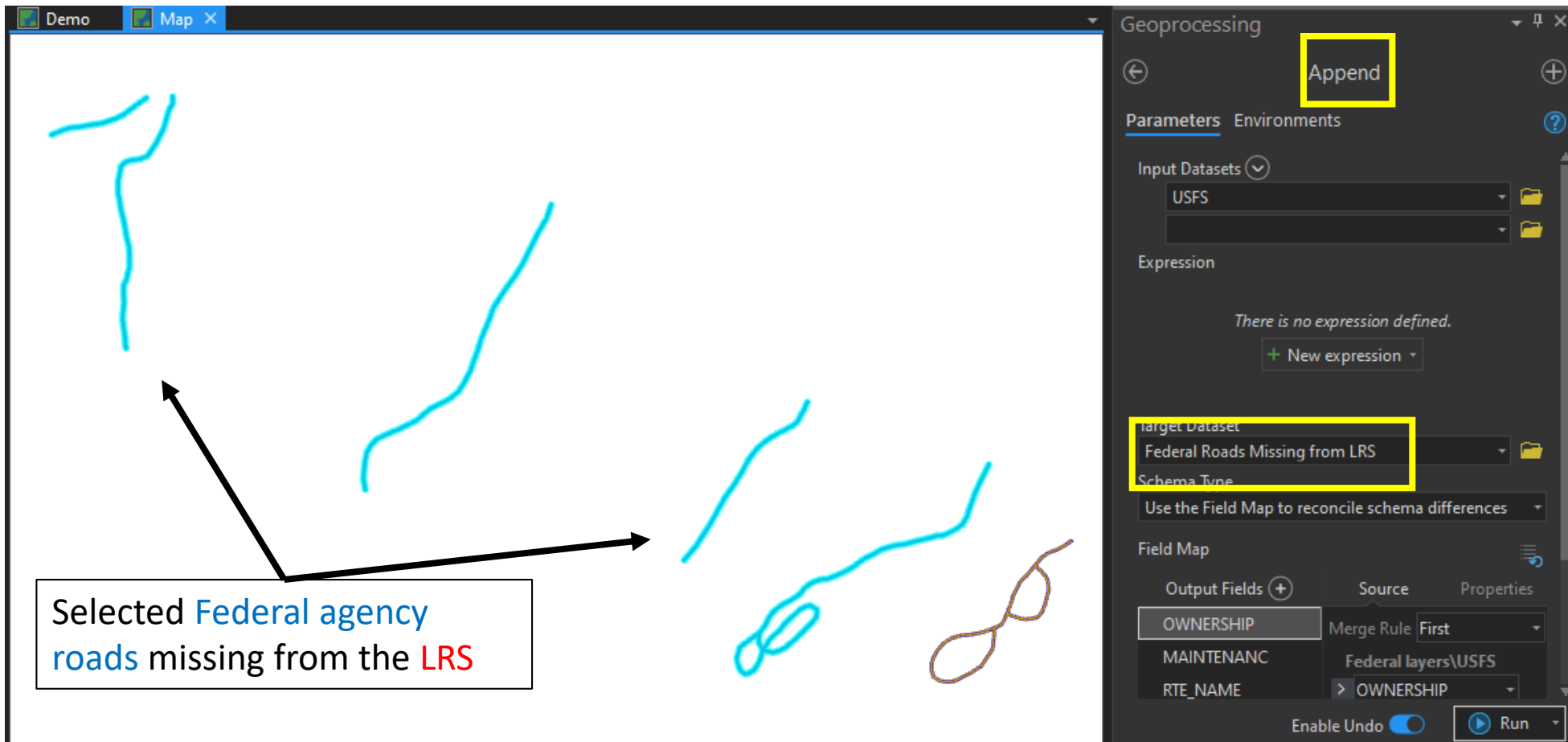
Manual Editing 3 (append to missing)

Append any newly discovered Federally owned roads that are missing from the LRS to the **"Fed_MissingFrom_LRS"** layer

Merge it All Together

After the manual editing process, Merge **"Fed_MissingFrom_LRS"** to **"Fed_Intersect_LRS"**

- Now the Federally owned roads that were missing from the LRS have been added to the **"Fed_Intersect_LRS"** dataset

Merge **"Fed_Intersect_LRS"** back into the full LRS
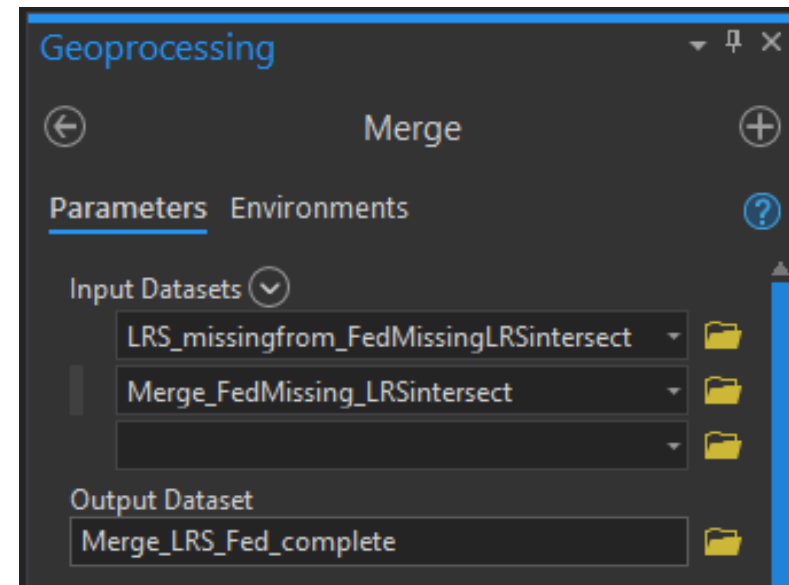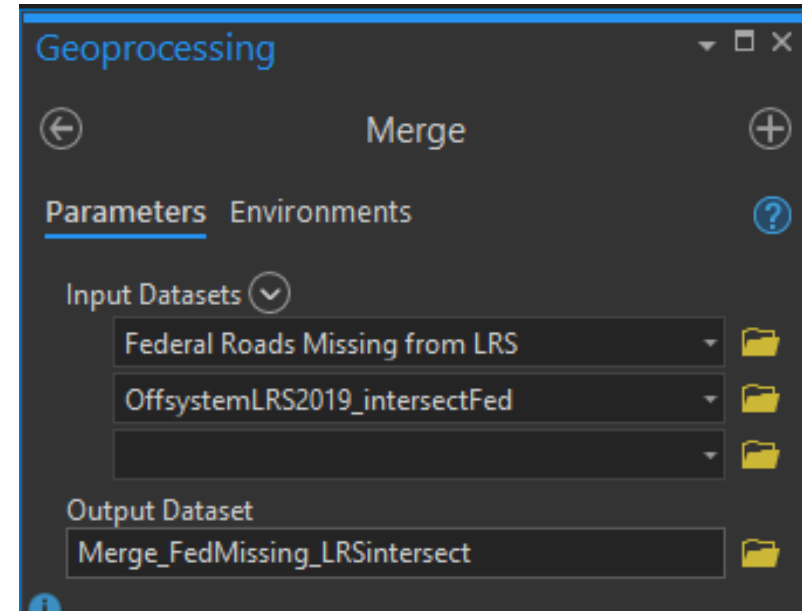
Final Mileage Comparison

Agency	Federal mileage	LRS mileage	Difference (Fed - LRS)
Bureau of Land Management	768.9454	785.2693	-16.3239
Bureau of Reclamation	469.2541	426.5941	42.66
National Park Service	862.5024	857.099	5.4034
US Fish and Wildlife Service	167.9095	167.449	0.4605
US Forest Service	8,095.2786	8,089.3243	5.9543
Total	**10,363.89**	**10,325.7357**	**38.1543**

99.63% of Federal roads
successfully incorporated

Lingering Issues…

- Methodology is very lengthy (3 months to incorporate 5 Federal agencies)

- Are all the Federally owned roads publicly accessible (belong in LRS)?
  - A public road is any road or street owned and maintained by a public authority and open to public travel. [23 U.S.C. 101(a)].
  - … must be … passable by four-wheel standard passenger cars, and open to the general public for use without restrictive gates, prohibitive signs, or regulation … [23 CFR 460.2(c)]

- Roads with conflicting Federal ownership
  - 20 road segments, approx. 55 miles

- Accuracy of Federally owned roads compared to Local LRS

Questions?

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